

# Stepper Motor Failure

## The stepper motor problem

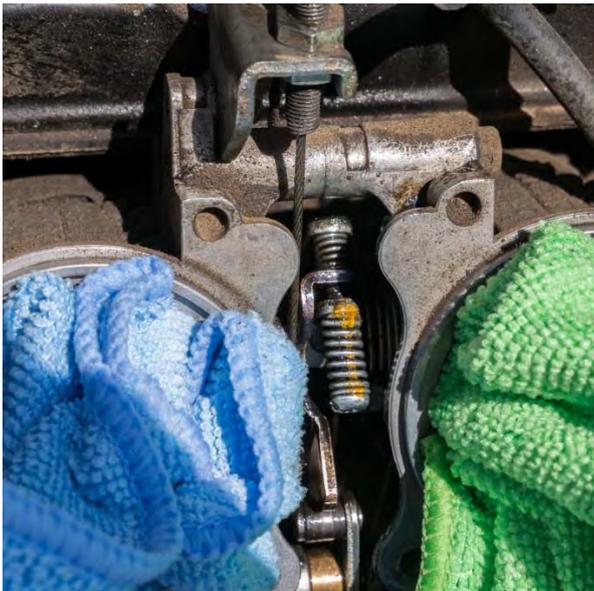
The stepper motor is an electromechanical device managed by the ECU to control Tiggers idle (tickover) speed. It's common for it to cause problems with the earlier Tiger 800's. Symptoms include erratic idling, stalling and sometimes difficulty in starting.

Since the beginning of this trip I have religiously kept the stepper motor clean during regular servicing. It's also essential to clean and lubricate the roller and throttle linkages that the stepper motor engages with. I'm convinced that problems people report are related to dirty roller and linkages and not inherently an issue with the stepper motor which continues to function. Actual failure of the stepper motor is quite rare.

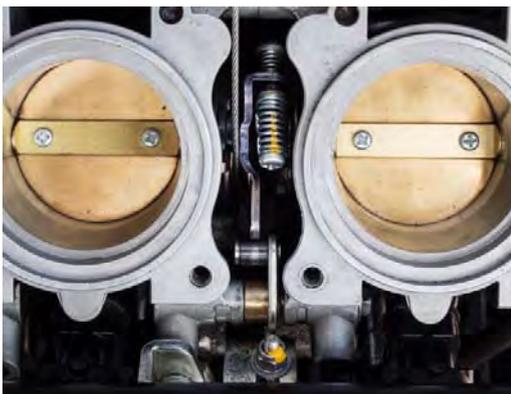
For a couple of days Tigger had laboured after starting. Instead of leaping into life on the starter button and immediately settling down to a tickover of about 1,200 rpm he would labour at about 600 – 800 rpm and then increase slowly to 1,200. I made a mental note that next time the tank and air filter were off I'd have to give everything a thorough clean.

The next day, I had no idle at all. On starting I had to hold the throttle open to maintain any revs at all. Letting go would result in Tigger immediately cutting out. Hmmm, this would require a bit of investigation. It was safe to ride the bike but I'd rather not have to manage the throttle just to prevent stalling.

The failure occurred at 49,579 miles and is documented in the [full maintenance and repair log \(click to view, opens in a new tab\)](#).



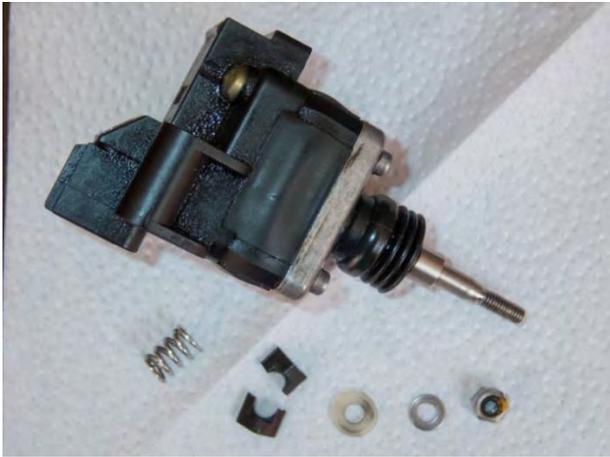
*Top of the stepper, throttle linkages and inlets. This whole area gets really dirty, this was a picture from Mexico about 3,000 miles after the last clean. It's the dirt and grime that causes poor idling and stalling.*



*After a clean up. Usually enough to keep things nicely ticking over.*

## The diagnosis

We crossed the border back into Colombia (the crossing was just a reversal of the crossing in the opposite direction [documented in this blog entry](#)), and booked ourselves into the Hotel Avanty in Ipiales. With their secure underground parking this was an ideal place to work on the bike. On disassembly it was immediately obvious what the issue was. A small plastic part that pushes against the throttle linkage had broken. I've never seen this failure mechanism reported elsewhere. It's clear in the picture below what the issue was. Hint, the two small black parts at the bottom of the photo should be in one piece.



*A quick clean isn't going to sort this out.*



*Not seen anyone report this kind of failure before.*

## The solution

My initial thought was to try and fix the piece that had broken. Thorough cleaning and subsequent gluing of the part with superglue was not a success. It lasted all of three seconds before falling apart again. In hindsight it was a stupid idea. Secondly, I tried shaping and using washers but these were easily bent and idle was not good. I did consider trying to get a new part made from aluminium in a small workshop but couldn't find anyone interested in taking the job on.

The answer was to completely bypass the stepper motor. This entailed removal of the offending device and replacing with a mechanical means of managing tickover. It's necessary to cable tie (zip tie) the stepper motor out of the way and keep it connected to the ECU. Not doing so would result in the ECU throwing lots of error codes at it looked for the stepper. The check engine light on the console would also be constantly illuminated.

I'd seen a solution many moons ago on [advrider.com](#). Searches found the thread where the solution was discussed but all the photos had disappeared so it was difficult to visualise. Then I remembered that our friend Glen Cochrane from Australia had made the same repair to his bike in Panama. An email to Glen and we had the details. Cheers Glen.

Side note: We'd initially met Glen in Dawson City, in the Yukon, and [met up again in Guatemala](#) where we adjusted his valve clearances in a hotel car park :-).

Here's what we needed:

A piece of angle iron about 60mm in length

An M6 bolt 100mm in length

5 x M6 hex nuts

And somewhere to do some cutting and drilling

Scouring the "workshop" part of town we eventually found a place that not only seemed to understand what I needed but could also do the job that afternoon. They didn't have angle iron so instead fabricated a piece by welding two pieces of metal together. What they produced wasn't pretty as you can see. Total cost was 40,000 Colombian pesos, About £10 GBP.

I fitted the new adjuster, made a best guess for adjustment, and replaced the airbox and fuel tank. One press of the starter and Tigger sprung into life and idled at a rather brisk 1,400 rpm. A few tweaks with a pair of open ended spanners and the idle was just where it needs to be. Note that it's possible to adjust the idle at the side of the road without removing any components from the bike. Nice.



*A few hours trying to find a workshop that understood what I needed and were willing to help and I was set. Took about 3 hours to make the manual adjuster and so far no issues at all. Not at all pretty though.*



*Manual adjuster fitted in place of the stepper. The two longer screws towards the left, front and rear, are re-used from the stepper motor. Never know if I might need to refit one.*



*A few minor adjustments here and there.*



*Not sure why they didn't use their pillar drill?????*

Since fitting the manual adjuster I've had no issues with Tigger's idle. Regardless of temperature or altitude, idle has held steady at 1,100 rpm. I couldn't be happier with the outcome as it effectively removes one electronic component from the bike. Highly recommended as a remedial solution or a pre-emptive strike before the dreaded stepper motor ruins your ride..

Saludos, Steve and Tigger.